

Instruction: Express each of the following as a single fraction in its lowest terms.

1. $\boxed{\frac{2x}{y}}$

2. $\frac{(m-n)^2}{m^2-n^2} = \frac{(m-n)^2}{(m+n)(m-n)} = \boxed{\frac{m-n}{m+n}}$

3. $\boxed{\frac{q}{p-q}}$

4. $\boxed{-\frac{4}{u}}$

5. $\boxed{\text{Does Not Simplify}}$

6.

$$\begin{aligned} \frac{4}{2x+4} + \frac{8}{x^2-4} &= \frac{4}{2(x+2)} + \frac{8}{(x+2)(x-2)} \\ &= \frac{2}{x+2} \cdot \frac{x-2}{x-2} + \frac{8}{(x+2)(x-2)} \\ &= \frac{2x-4}{(x+2)(x-2)} + \frac{8}{(x+2)(x-2)} \\ &= \frac{2x+4}{(x+2)(x-2)} \\ &= \frac{2(x+2)}{(x+2)(x-2)} \\ &= \boxed{\frac{2}{x-2}} \end{aligned}$$

7. $\boxed{\frac{2}{2x^2+x}}$

8. $\boxed{-\frac{1}{2x+4}}$



Math Olympiad and Problem Solving Programs
E120 - Honors Algebra Problem Solving
Problem Set 21.1 - Special Algebraic Rules

Name:

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9.

$$\begin{aligned}\frac{4x^2}{9-x^2} + \frac{2x}{x-3} &= \frac{4x^2}{(3+x)(3-x)} + \frac{2x}{-(3-x)} \\ &= \frac{4x^2}{(3+x)(3-x)} - \frac{2x}{3-x} \cdot \frac{3+x}{3+x} \\ &= \frac{4x^2}{(3+x)(3-x)} - \frac{6x+2x^2}{(3+x)(3-x)} \\ &= \frac{2x^2-6x}{(3+x)(3-x)} \\ &= \frac{2x(x-3)}{-(3+x)(x-3)} \\ &= \boxed{-\frac{2x}{3+x}}\end{aligned}$$

10. $\boxed{\frac{x^2+3x-2}{x^2-3x-10}}$